Drawing Issues

The draftsperson has objected to the informal drawings submitted with the application on 16 July 1998. Applicant has filed since a set of formal drawings to the draftsperson on 4 September 1998. Applicant respectfully submits that these formal drawings address the concerns raised by the draftsperson. A copy of the 4 September 1998 formal drawing submission is attached hereto.

Specification Issues

The Examiner has objected to the specification because of the following informalities: on page 12, 13 and 14, reference 16 refers to both the SOG and photo mask, however, references 16 and 26 are also used for the photo mask. Applicant has amended the specification to make proper reference to the "photo mask with polarizing SOG" (reference 16) and to the "polarizing sections" (reference 26). Reference 16 represents the subassembly consisting of the photo mask and the polarizing SOG. The individual portions of the subassembly are depicted as items 10 and 12 of Fig. 1C. Reference 26 refers to those portions of the polarizing SOG that are not covered by an opaque layer. See, Fig. 2. Applicant has changed the references in the specification to be consistent with this meaning.

35 U.S.C. § 112 Issues

The Examiner has rejected claims 1 through 9 under 35 USC § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Specifically, in claims 1 and 7, "the optical transmission" and "the contrast" lack proper antecedent basis.

Applicant has amended claims 1 and 7 to address these concerns. Applicant has deleted the reference to "the" optical transmission, and rephrased "the contrast" such that the optical image is now defined as having varied contrast. Applicant respectfully submits that the amendments to claims 1 and 7 now place these claims, and those dependent thereon, in a condition for allowance over the stated 35 USC § 112, second paragraph, rejections.

35 U.S.C. § 103 Issues

The Examiner has rejected claim 1 under 35 USC § 103(a) as being unpatentable over Tanabe (U.S. Patent No. 5,559,583) in view of Matsumoto (U.S. Patent No. 5,541,026). Applicant respectfully submits that this claim is neither anticipated by or obvious from the cited prior art for the reasons stated below.

The Examiner states that Tanabe discloses an apparatus for exposing a substrate with a polarizer capable of adjustment and removed from the photo mask. The Examiner then combines Matsumoto's photo mask, impregnated with a second polarizer, to the teaching of Tanabe. Applicant respectfully submits that this combination is not appropriate for two reasons. First, there is no suggestion in either prior art for this combination. The cited prior art patents were individually attempting to provide an enhanced lithographic process through the polarization of exposure light. In both cases, single polarizers were introduced into the optical transmission path. However, neither art teaches, discloses, or suggests a dual polarizing system, wherein a first polarizer is used to transmit polarized light to a second polarizer within the photo mask subassembly. Indeed, the objectives of each prior art patent are individually achieved without the addition of a second polarizer. Therefore, any suggestion of adding a second polarizer was not needed. The courts have been quite clear on when

combinations are appropriate for § 103(a) prior art. This knowledge must be conveyed or suggested in the cited prior art in order to be relevant. "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." In re Fine, 837 F.2d 1071, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988) (citing, W.L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983)). The cited prior art does not suggest the desirability of this combination. There exists no evidence, teaching, or disclosure of a motivating force which would impel persons of ordinary skill in the art to do what the applicant has done, that is, to combine two polarizers in series within the optical transmission path, one polarizer within the photo mask, and the other removed from the photo mask and capable of in-situ adjustment.

Second, the prior art of Matsumoto effectively teaches away from the combination of a dual polarizing system. Specifically, in two of Matsumoto's three embodiments, portions of the photo mask are provided with opposing sets of polarizing members for transmitting light beams which vibrate in directions perpendicular to each other. Matsumoto, column 13, lines 61-65; column 18, lines 27-35; Figs. 4, 5a, 6, and 7a. Importantly, in these two embodiments, a polarized light beam that is aligned to pass through one polarizing member in the photo mask cannot pass simultaneously through the second polarizing member in the same photo mask, since these polarizing members are perpendicular to each other. This means that that addition of a "removed" polarizer, i.e., a polarizer other than those found in the (Matsumoto) photo mask, would be adjustable for maximum light intensity for only one of the two photo mask

polarizers, and defeat the polarization effects of the second polarizing member in the photo mask. Thus, Matsumoto's teaching of using these polarizing member portions in the photo mask in tandem would be defeated by the addition of the removed, adjustable polarizer of Tanabe. Whenever an operator attempted to maximize the effect of one polarizing member in the photo mask by adjusting a polarizer separate from the photo mask, the second polarizer in the photo mask would not be contributing to the light transmission. This is contrary to the teaching of Matsumoto. Consequently, the combination of these prior art patents is detrimental to their individual teachings and disclosures. In order for Matsumoto's embodiments to work, there can be no additional, removed polarizer in the optical path. To do so, would defeat the purpose of having two types of polarizing portions in the photo mask. Clearly, the Matsumoto disclosure is neither suggesting or teaching of using a polarizer removed from the photo mask, since this would defeat two out of three preferred embodiments. For the reasons stated above, applicant respectfully submits that claims 1 and 7 remain in a condition for allowance over the cited prior art of Tanabe and Matsumoto. Additionally, the claims dependent upon these independent claims would also remain in a condition for allowance.

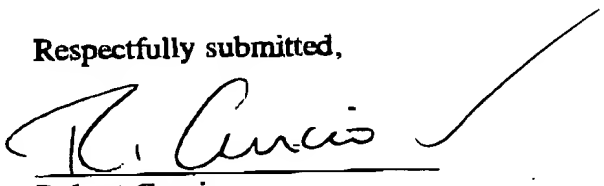
The Examiner has further rejected claims 3 and 6 under 35 USC § 103(a) as being unpatentable over Tanabe in view of Matsumoto and in further view of Okamoto et al. (U.S. Patent No. 5,902,705). Applicant relies, in part, on the reasons stated above for distinguishing the cited prior art of Tanabe and Matsumoto from the instant invention. Applicant further submits that Okamoto (and Matsumoto) do not use a spin-on-glass layer impregnated with polarizing members. Okamoto uses the spin-on-glass layer to provide the phase shifting for the transmitted light. Thus, no polarizing members are introduced in the Okamoto photo mask.

Matsumoto teaches using "polarizing means formed on the *light transmitting portions of the transparent substrate*." Matsumoto, column 3, lines 23-24 (emphasis added). In contrast, the instant invention introduces a polarizing film in the phase shifting layer 12 on top of the transparent substrate 10. Specification, page 11, lines 8-11 and lines 21-24; Figs. 1A-1C.

Applicant has added new independent claims 17 and 18, correlating to original claims 1 and 7, respectively, that further claim having the polarizing members within the spin-on-glass layer. Applicant submits that these newly added claims are further distinguishable over the cited prior art for the reasons stated above, and are in a condition for allowance.

For the reasons given above, applicant respectfully submits that the claims of the instant application are placed in a condition for allowance. Reconsideration of the rejections and allowance of the claims are respectfully solicited. Any matters which may be handled by telephone should be directed to the undersigned at (203) 787 - 0595.

Respectfully submitted,



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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date indicated below as first class mail in an envelope addressed to the Assistant Commissioner of Patents and Trademarks, Washington, DC 20231.

Name: Barbara Browne Date: February 9, 2000 Signature: